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Proceedings of the regional peer review meeting on the importance of bycatch in the northern shrimp fishery in the Estuary and northern Gulf of St. Lawrence

October 23, 2012

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Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

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SUMMARY

A regional peer review meeting on the importance of bycatch in the northern shrimp fishery in the Estuary and northern Gulf of St. Lawrence was held on October 23, 2012 at the Maurice Lamontagne Institute in Mont-Joli. This meeting gathered thirty participants from sciences, management and industry. This proceeding contains the essential parts of the presentations and discussions during the meeting and presents the recommendations and conclusions stemming from the peer review.

Compte rendu de l'examen par des pairs régional sur l'importance des prises accessoires de la pêche à la crevette nordique dans l'estuaire et le golfe du Saint-Laurent

SOMMAIRE

Une réunion du processus régional de revue par les pairs sur l'évaluation de l'importance des prises accessoires de la pêche à la crevette nordique dans l'estuaire et le golfe du Saint-Laurent a eu lieu le 23 octobre 2012 à l'Institut Maurice-Lamontagne à Mont-Joli. Cette réunion a réuni une trentaine de participants des sciences, de la gestion et de l'industrie. Ce compte rendu contient l'essentiel des présentations et des discussions qui ont eu lieu pendant la réunion et fait état des recommandations et conclusions émises au moment de la revue.

INTRODUCTION

The northern shrimp fishery is carried using otter trawls with small mesh sizes (minimum mesh size of 44 mm). The mandatory use of a separator grate during fishing operations has led to a significant reduction in catches of large fish. However, small fish may be retained by the trawls and are between 1 and 2% of the total catch of shrimp.

In compliance with the United Nations Food and Agriculture Organization's (FAO) Code of Conduct for Responsible Fisheries, DFO promotes responsible fishing aimed at reducing by-catches and mitigating impacts on habitat wherever biologically justifiable and cost effective. The Policy Framework on Managing Bycatch and Discards (currently under development) aims to ensure that Canadian fisheries are managed in a manner that supports the sustainable harvesting of aquatic species by 1) Minimising the risk of fisheries causing serious or irreversible harm to bycatch and discard species 2) Accounting for total catch, including bycatch and discards.

The northern shrimp fishery in the Estuary and northern Gulf of St. Lawrence has been certified sustainable and properly managed according to the Marine Stewardship Council (MSC) criteria for wild fisheries. However, the current certification is subject to certain conditions focusing mainly on determining the impact of trawls used.

The objectives of this review were to :

- Describe and assess the importance of bycatch of shrimp fishery.
- Assess the potential impact of bycatch on species stocks that are not targeted by shrimp fishery.

This proceeding reports on the main points discussed in the presentations and deliberations stemming from the discussions at the meeting. The regional review is a process open to all participants who are able to provide a critical outlook on the importance of bycatch in the northern shrimp fishery in the Estuary and Gulf of St. Lawrence. In this regard, participants from outside the DFO are invited to take part to the meeting within a defined framework for this review (Appendices 1 and 2). The proceedings also focus on recommendations made by the meeting participants.

DETAILED DISCUSSIONS

CONTEXT

Meeting chairperson Charley Cyr welcomes the participants and describes the meeting's objectives. He also makes a few clarifications to ensure that the meeting runs smoothly. He reviews the meeting schedule (Appendix 3) in relation to the terms of reference. This meeting is being held as part of the renewal of the eco-certification of the northern shrimp fishery, and follows a previous meeting held in May at the Maurice Lamontagne Institute on the impact of fishing gear on northern shrimp habitat. This meeting will primarily address the importance of bycatch in the northern shrimp fishery in the Estuary and Gulf of St. Lawrence.

POLICY FOR MANAGING BYCATCH AND DISCARDS – Cédric Arseneau (DFO)

Cédric Arseneau provides an overview of the Policy Framework on Managing Bycatch and Discards, which is currently under development. He presents the purpose and strategies of the policy, as well as the area it covers. This policy follows the FAO's 2011 International Guidelines on Bycatch Management and Reduction of Discards. It is also aligned with the sustainable fisheries framework. Its aim is to document the decision-making processes. It also aims to ensure that Canadian fisheries are managed in a manner that supports the sustainable harvesting of aquatic species and minimizes the risk of fisheries causing serious or irreversible harm to bycatch species. The policy will take all catches into account, with the exception of directed catches, that is, all catches that are retained, preserved and released.

The six strategies included in the policy aim to 1) gather bycatch information; 2) assess bycatch impact on stocks; 3) in the event that there is an impact, work on the gear to minimize bycatches; 4) maximize the survival of bycatches not retained and released back into the water; 5) avoid exceeding the harvest levels (dangerousness) established for the species. In this case, we recommend a precautionary approach to bycatches through the establishment of a critical harvest threshold; and 6. develop a list of management measures based on the various critical thresholds established in strategy 5.

The information that results from this strategy will be included in the Integrated Fisheries Management Plan (IFMP). The purpose of this meeting is to address steps 1 and 2, that is, to qualify and quantify bycatches and determine whether there is a risk to stocks. The northern shrimp fishery is the first fishery to participate in this exercise. The policy does not define the tools to be used to gather information. With respect to the shrimp fishery, the data entered into the database will be taken from the at-sea observer program.

With DFO's announcement that the industry will assume the full costs of the observer program, some participants are wondering whether this will have a negative impact on information gathering. The industry will need to hire companies certified by DFO, which should ensure the quality of the information gathered to a certain extent. The possibility of using other types of tools to oversee bycatches, such as video monitoring equipment, is discussed and seems to work well for Pacific halibut. However, it appears that this tool will not be adjusted for the Gulf of St. Lawrence shrimp fishery.

IMPORTANCE OF SHRIMP FISHERY BYCATCH – Louise Savard (DFO)

Louise Savard provides an overview of her presentation. The study area is the Northern Gulf of St. Lawrence. The results were calculated for the entire Gulf based on Northwest Atlantic Fisheries Organization (NAFO) unit areas. The study covers the period from 2000 to 2011, inclusively.

Inputs

The data used in this study was taken from the observer database. In total, 14 185 tows were documented between 2000 and 2011. Tow duration by year is presented in a graph. Some data discrepancies related to the duration and location of the tows were removed from the analyses to ensure that the results were accurate. The data summarizing the information on the duration

of observed tows, the fishing effort and the weighting factor used to extrapolate the results to all fishery statistics are presented for each sub-area.

Given that bycatch weight is measured in kilograms with a resolution of 1 kg, and that over 60% of bycatches fall within this category, efforts were made to specify the true weight of these catches. To improve the accuracy of this value, tow frequency distribution by weight class was modeled using gamma distribution to estimate the average weight of the first class (1 kg) that would be used to estimate bycatches. This correction was made to 64 taxa.

The list of taxa identified by at-sea observers while fishing shrimp in the Estuary and Northern Gulf of St. Lawrence between 2000 and 2011 is presented; 280 taxa were identified and divided into fish (191) and invertebrates (89). Some reports were not taken into account in the analyses because the species could not be properly identified. This proportion represents 0.056% of the total catches recorded. In some cases, the taxa were regrouped. These taxa often represent one species recorded under several names or similar species that are easily confused. The list of 280 taxa was therefore reduced to 97 bycatch taxa.

To obtain more accurate data, observer training on species identification should be improved.

The method used in the previous stock assessments was applied to fishing effort data to scale the observers' results for consistency with all shrimpers. To calculate total annual bycatch, weighting cells (grouping unit area or fishing area if few observations were recorded) were used to compare the catches reported by observers by NAFO unit area and by fishing area to the total shrimper effort. Whenever possible, an estimate of biomass and abundance was also calculated using data from DFO's annual research survey. However, some species were too poorly represented in the survey catch to allow for this.

RESULTS

Observer deployment

The observers' analysis of tow distribution by fishing effort shows that observers were deployed to the most harvested areas. Moreover, the tows covered by the observers crossed the entire territory. These results are also consistent with a study aiming to determine whether observers are deployed at random. The results of this study (Benoit and Allard 2009) reveal that observer deployment for shrimp fishing was indeed random. Furthermore, the fact that the difference between the estimated shrimp catch based on observer data and the official landings is only 2% proves that observer deployment for the shrimp fishery had no effect on fishing habits, and that the observation results can be extrapolated to the entire fleet.

Occurrence and total catch recorded by observers

An initial estimate of the ratio of bycatches to shrimp catches was performed for all 280 taxa. The vast majority of these catches were not retained. Among the 97 taxa retained, 16 of these were present in at least 10% of tows, whereas 59 were observed in less than 1% of tows. The 10 most common species were Greenland Halibut, Capelin, Redfish, Herring, American Plaice, Witch Flounder, White Barracudina, Thorny Skate, Hagfish and Grenadier, while the 10 species with the largest catches were Capelin, Greenland Halibut, Atlantic Herring, Redfish, American Plaice, White Shrimp, Witch Flounder, Cod, Thorny Skate and White Barracudina.

One participant estimates that the value of the initial estimate (4%) is much too high and suggests, for example, that the value may be overestimated by a factor of 10. The relevance of using the average, rather than the median, to estimate bycatches is discussed as the average may be overly influenced by some extreme values. Ms. Savard suggests that the calculation be performed again over lunch using the median value, as the average seems to have overestimated the results.

The meeting continues with explanations of the results shown in the document provided to participants. The species to species comparison allows for a check to be performed against the research surveys, thereby determining the relative importance of bycatch. This comparison is difficult as selectivity and catchability are so different that bycatch impact is undoubtedly overestimated. Most bycatches retained by shrimpers are under 31 cm in length. The portion of the population in this size class was calculated and the results presented in several tables.

Two new estimates of the ratio of bycatches to shrimp catches are done. The sum of bycatches divided by the sum of shrimp catches equals 1.7%. Moreover, when the average is replaced with the median, the value becomes 1%.

Two taxa, Sand Lance and Squid, were present in at least 10% of stations. As no numerical or biomass values were available for either species, no comment can be made on the bycatch importance. It should also be noted that these species are not commercially harvested in the Gulf.

Less common species are divided into 26 taxa caught in over 100 tows and in under 1400 tows, that is, between 1 and 10% of tows. These taxa represent a bycatch of less than 1% of the biomass for the species that could be estimated.

The other taxa (54) were present in less than 1% of the tows analyzed. Bycatches for these species range from a few tens of kilograms to a few hundred kilograms per year. The catches are relatively surprising and questionable for many of these species; for example, 69 tonnes of Argentine in 2002, 35 tonnes of Smelt in 2009 and 11 tonnes of Fourline Snakeblenny in 2011.

The status of catches of species at risk is presented and briefly discussed. Three species are present in the bycatches: Striped Bass, Northern Wolffish and Spotted Wolffish. However, these species represent only a minute fraction of the bycatches.

CONCLUSIONS

A variety of species are frequently found in northern shrimp fishery bycatches. However, they are slight compared to catches of the targeted species, as the bycatch ratio represents 1.71% of northern shrimp catches for the period from 2000 to 2011. In the case of fish, when compared to Northern Gulf populations, bycatches generally represent less than 1% of the population or the biomass. Bycatches contribute to an increased mortality of these species, but this increase is marginal compared to the normal mortality rate for juveniles and adults in these populations.

After this observation is made, the group reviews the highlights.

APPENDICES

1- Participants list

Name	Affiliation
Archambault, Diane	DFO Science
Arseneau, Cédric	DFO Fisheries Management
Bernier, Brigitte	DFO Science
Bernier, Denis	DFO Science
Bourdages, Hugo	DFO Science
Brulotte, Sylvie	DFO Science
Castonguay, Martin	DFO Science
Chabot, Denis	DFO Science
Côté, Mario	Association des capitaines propriétaires de la Gaspésie (ACPG)
Cotton, Allen	Association des capitaines propriétaires de la Gaspésie (ACPG)
Coulombe, Francis	MERINOV Gaspé
Cyr, Charley	DFO Science
Dallaire, Jean-Paul	DFO Science
Denis, Marcel	Association des capitaines propriétaires de la Gaspésie (ACPG)
Desgagnés, Mathieu	DFO Science
Dupuis, Dan	Association des capitaines propriétaires de la Gaspésie (ACPG)
Ferguson, Annie	MAAP-NB
Gauthier, Johanne	DFO Science
Gendron, Louise	DFO Science
Grégoire, François	DFO Science
Hurtubise, Sylvain	DFO Science
Lambert, Yvan	DFO Science
Lanteigne, Jean	Fédération régionale acadienne des pêcheurs professionnels (FRAPP)
Legere, Michel	Association des crevettiers acadiens du Golfe (ACAG)
Metallic, Christopher	Listuguj Mi'gmac First Nation
Michaud, Sonia	DFO Science
Morin, Bernard	DFO Fisheries Management
Roussel, Éda	Association des crevettiers acadiens du golfe (ACAG)
Sainte-Marie, Bernard	DFO Science
Samuel, Sylvain	Association des capitaines propriétaires de la Gaspésie (ACPG)
Savard, Louise	DFO Science

2- Terms of reference

Importance of bycatch in the northern shrimp fishery in the Estuary and northern Gulf of St. Lawrence

Regional Peer Review - Quebec Region

Mont-Joli, QC
October 23, 2012

Chairperson: Charley Cyr

Context

The northern shrimp fishery is carried using otter trawls with small mesh sizes (minimum mesh size of 44 mm). The mandatory use of a trawl with a separator grate during fishing operations has led to a significant reduction in catches of large fish. However, small fish may be retained by the trawls and are between 1 and 2% of the total catch of shrimp.

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Objectives

- Describe and assess the importance of bycatch of shrimp fishery.
- Assess the potential impact of bycatch on species stocks that are not targeted by shrimp fishery.

Expected publications

- A CSAS Science Advisory Report on bycath of shrimp fishery in the Gulf of St. Lawrence.
- CSAS Proceedings summarizing the discussions.
- CSAS research documents.

Participation

- DFO Science and Fisheries Management Branches
- Fishing industry
- Provincial representatives
- Aboriginal communities/organizations

3- Agenda

Importance of bycatch in the northern shrimp fishery in the Estuary and northern Gulf of St. Lawrence

October 23, 2012
Mont-Joli, Qc

09:00	Chairperson introduction and participant presentation -Charley Cyr (DFO)
09:10	Context : Bycatch Policy - Cedric Arseneau (DFO)
09:20	Importance of bycatch in the northern shrimp fishery – Louise Savard (DFO)
10:15	Break
10:30	Importance of bycatch in the northern shrimp fishery – Louise Savard (DFO)
12:00	Lunch
13:00	Discussion – All
14:30	Summary and Advice review – All